

Amendments to the Claims

Claims 1 and 2 (**Canceled**)

Claim 3 (**Previously Presented**) A voice pitch normalization apparatus for recognizing an incoming command voice uttered by a speaker based on sample data for a plurality of words, said voice pitch normalization apparatus comprising:

a voice analyzer operable to calculate a probability indicating a degree of coincidence among a target voice signal and each of the plurality of words in the sample data; and

a voice pitch normalization device operable to generate the target voice signal by changing the incoming command voice on a predetermined degree basis and operable to change the target voice signal in voice pitch until a maximum of probabilities reaches a predetermined probability or higher, wherein

said voice pitch normalization device is operable to increase or decrease the target voice signal on the predetermined degree basis when the maximum of the probabilities is smaller than the predetermined probability, and

said voice pitch normalization device comprises:

a memory operable to temporarily store the incoming command voice;

a read-out controller operable to read out a string of the incoming command voice from said memory and generate the target voice signal; and

a read-out clock controller operable to generate a read-out clock signal with a timing clock determined by frequency, and output the timing clock to said memory to change, with a timing specified by the timing clock, a frequency of the target voice signal on the predetermined degree basis.

Claim 4 (**Currently Amended**) A The-voice pitch normalization apparatus-as-claimed-in-claim 2, for recognizing an incoming command voice uttered by a speaker based on sample data for a plurality of words, said voice pitch normalization apparatus comprising:

a voice pitch normalization device operable to change a target voice signal in voice pitch on a predetermined degree basis; and

a voice analyzer operable to calculate probabilities each indicating a degree of coincidence between the target voice signal and a different one of the plurality of words in the sample data, and calculate a maximum probability among the probabilities, wherein

until the maximum probability is equal to or greater than a predetermined probability, said voice pitch normalization apparatus is operable to cause said voice pitch normalization device to change the target voice signal in pitch and said voice analyzer to calculate the maximum probability based on the changed target voice signal, and

said voice pitch normalization device is operable to increase the target voice signal in voice pitch on the predetermined degree basis when the maximum probability is smaller than the predetermined probability starting from a pitch level of the incoming command voice.

Claim 5 (Currently Amended) A voice pitch normalization apparatus-as-claimed in claim 2, for recognizing an incoming command voice uttered by a speaker based on sample data for a plurality of words, said voice pitch normalization apparatus comprising:

a voice pitch normalization device operable to change a target voice signal in voice pitch on a predetermined degree basis; and

a voice analyzer operable to calculate probabilities each indicating a degree of coincidence between the target voice signal and a different one of the plurality of words in the sample data, and calculate a maximum probability among the probabilities, wherein

until the maximum probability is equal to or greater than a predetermined probability, said voice pitch normalization apparatus is operable to cause said voice pitch normalization device to change the target voice signal in pitch and said voice analyzer to calculate the maximum probability based on the changed target voice signal, and

said voice pitch normalization device is operable to decrease the target voice signal in voice pitch on the predetermined degree basis when the maximum probability is smaller than the predetermined probability starting from a pitch level of the incoming command voice.

Claims 6 and 7 (Canceled)

Claim 8 (**Currently Amended**) A ~~The~~ voice recognition device as claimed in claim 7, for recognizing an incoming command voice optimally normalized for voice recognition based on sample data for a plurality of words, said voice recognition device comprising:

_____ a voice pitch normalization device operable to change a target voice signal in voice pitch on a predetermined degree basis; and

_____ a voice analyzer operable to calculate probabilities each indicating a degree of coincidence between the target voice signal and a different one of the plurality of words in the sample data, and calculate a maximum probability among the probabilities, wherein

_____ until the maximum probability is equal to or greater than a predetermined probability, said voice recognition device is operable to cause said voice pitch normalization device to change the target voice signal in pitch and said voice analyzer to calculate the maximum probability based on the changed target voice signal,

_____ said voice pitch normalization device is operable to increase or decrease the target voice signal on the predetermined degree basis when the maximum probability is smaller than the predetermined probability, and

_____ said voice pitch normalization device comprises:

_____ a memory operable to temporarily store the incoming command voice;

_____ a read-out controller operable to read out a string of the incoming command voice from said memory and generate the target voice signal; and

_____ a read-out clock controller operable to generate a read-out clock signal with a timing clock determined by frequency, and output the timing clock to said memory to change, with a timing specified by the timing clock, a frequency of the target voice signal on the predetermined degree basis.

Claim 9 (**Currently Amended**) A ~~The~~ voice recognition device as claimed in claim 7, for recognizing an incoming command voice optimally normalized for voice recognition based on sample data for a plurality of words, said voice recognition device comprising:

_____ a voice pitch normalization device operable to change a target voice signal in voice pitch on a predetermined degree basis; and

a voice analyzer operable to calculate probabilities each indicating a degree of coincidence between the target voice signal and a different one of the plurality of words in the sample data, and calculate a maximum probability among the probabilities, wherein

until the maximum probability is equal to or greater than a predetermined probability, said voice recognition device is operable to cause said voice pitch normalization device to change the target voice signal in pitch and said voice analyzer to calculate the maximum probability based on the changed target voice signal, and

said voice pitch normalization device is operable to increase the target voice signal in voice pitch on the predetermined degree basis when the maximum probability is smaller than the predetermined probability starting from a pitch level of the incoming command voice.

Claim 10 (Currently Amended) A ~~The~~ voice recognition device as claimed in claim 7, for recognizing an incoming command voice optimally normalized for voice recognition based on sample data for a plurality of words, said voice recognition device comprising:

a voice pitch normalization device operable to change a target voice signal in voice pitch on a predetermined degree basis; and

a voice analyzer operable to calculate probabilities each indicating a degree of coincidence between the target voice signal and a different one of the plurality of words in the sample data, and calculate a maximum probability among the probabilities, wherein

until the maximum probability is equal to or greater than a predetermined probability, said voice recognition device is operable to cause said voice pitch normalization device to change the target voice signal in pitch and said voice analyzer to calculate the maximum probability based on the changed target voice signal, and

said voice pitch normalization device is operable to decrease the target voice signal in voice pitch on the predetermined degree basis when the maximum probability is smaller than the predetermined probability starting-started from a pitch level of the incoming command voice.

Claims 11 and 12 (Canceled)

Claim 13 (**Currently Amended**) ~~A The-voice pitch normalization method as claimed in claim 12, further comprising:~~ for recognizing an incoming command voice uttered by a speaker based on sample data for a plurality of words, said voice pitch normalization method comprising:

temporarily storing the incoming command voice;

generating ~~a~~ the target voice signal from a string of the temporarily stored incoming command voice;

changing the target voice signal in voice pitch on a predetermined degree basis;

calculating probabilities each indicating a degree of coincidence between the target voice signal and a different one of the plurality of words in the sample data;

calculating a maximum probability among the probabilities;

when the maximum probability is smaller than the predetermined probability, one of increasing and decreasing the target voice signal on the predetermined degree basis; and

determining a timing clock by frequency, in such manner as to change, with a timing specified by the timing clock, a frequency of the target voice signal on the predetermined degree basis, wherein

until the maximum probability is equal to or greater than a predetermined probability, said changing of the target voice signal comprises changing the target voice signal in pitch, and said calculating of the maximum probability comprises calculating the maximum probability based on the changed target voice signal.

Claim 14 (**Currently Amended**) ~~A The-voice pitch normalization method as claimed in claim 12, further comprising~~ for recognizing an incoming command voice uttered by a speaker based on sample data for a plurality of words, said voice pitch normalization method comprising:

changing a target voice signal in voice pitch on a predetermined degree basis;

calculating probabilities each indicating a degree of coincidence between the target voice signal and a different one of the plurality of words in the sample data;

calculating a maximum probability among the probabilities;

when the maximum probability is smaller than the predetermined probability, one of increasing and decreasing the target voice signal on the predetermined degree basis; and

increasing the target voice signal in voice pitch on the predetermined degree basis starting from a pitch level of the incoming command voice, wherein

until the maximum probability is equal to or greater than a predetermined probability,
said changing of the target voice signal comprises changing the target voice signal in pitch, and
said calculating of the maximum probability comprises calculating the maximum probability
based on the changed target voice signal.

Claim 15 (**Currently Amended**) A ~~The voice pitch normalization method as claimed in claim~~
~~12, further comprising~~ for recognizing an incoming command voice uttered by a speaker based
on sample data for a plurality of words, said voice pitch normalization method comprising:

changing a target voice signal in voice pitch on a predetermined degree basis;
calculating probabilities each indicating a degree of coincidence between the target voice
signal and a different one of the plurality of words in the sample data;

calculating a maximum probability among the probabilities;
when the maximum probability is smaller than the predetermined probability, one of
increasing and decreasing the target voice signal on the predetermined degree basis; and

decreasing the target voice signal in voice pitch on the predetermined degree basis
starting from a pitch level of the incoming command voice, wherein

until the maximum probability is equal to or greater than a predetermined probability,
said changing of the target voice signal comprises changing the target voice signal in pitch, and
said calculating of the maximum probability comprises calculating the maximum probability
based on the changed target voice signal.